

## Original article

# Prevalence of HIV Seropositivity Among Sickle Cell Disease Patients at the Yaoundé Central Hospital.

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## RÉSUMÉ

### Introduction

Les patients drépanocytaires sont exposés à de multiples transfusions sanguines durant leur vie, du fait des anémies hémolytiques qui caractérisent cette maladie, avec un risque élevé d'infections comme celle par le virus de l'immunodéficience humaine (VIH). Nous avons mené une étude dans le but de déterminer la prévalence des anticorps Anti-VIH chez les malades drépanocytaires.

### Méthodologie

Il s'agit d'une étude descriptive, analytique, menée de juillet 2008 à janvier 2009, dans le service d'Hématologie de l'Hôpital Central Yaoundé au Cameroun. Les données cliniques, les antécédents transfusionnels ont été relevés et un test sérologique de HIV a été effectué par la méthode ELISA

### Résultats

Nous avons recruté 108 drépanocytaires homozygotes, âgés de 5 à 47 ans dont 57 de sexe masculin. Une sérologie positive au VIH a été retrouvée chez six (5,56 %) patients; parmi lesquels la majorité (5 patientes,  $p = 0.028$ ) était de sexe féminin. Tous les patients positifs ont déjà été transfusés et la séropositivité au VIH croissait avec le nombre de transfusions sanguines reçues ( $P < 0,05$ ,  $r = 0,243$ ).

### Conclusion

Ces résultats confortent la nécessité d'un dépistage systématique pré transfusionnel du VIH avec des programmes de recrutement des donneurs à faible risque. Il faudrait organiser au sein des associations des drépanocytaires des séances d'information et d'éducation vis-à-vis du VIH.

**Mots clés :** Drépanocytose, VIH, transfusion sanguine

## ABSTRACT

### Introduction and aim.

Sickle cell anemia (SCA) is an autosomal recessive genetic blood disorder, characterized by red blood cells that assume an abnormal, rigid, sickle shape and often shows itself by chronic hemolytic anemia. Patients are exposed to multiple blood transfusions throughout their life with a higher risk of contacting viruses such as major human immunodeficiency virus (HIV). The aim of this study was to estimate the prevalence HIV infection in sickle cell patient accounting the number of received transfusions.

### Patients and methods

This was a cross sectional analytical study performed on the sickle cell patients of the sickle cell clinic of the Yaounde Central Hospital from July 2008 to January 2009. Sociodemographic data, transfusion history were recorded. A serological testing with ELISA method was done.

### Results:

Hundred and eight (108) patients were enrolled after obtaining informed consent. More than half (52.78%) was male and the mean age of patients was  $21 \pm 9$  years (5-47). HIV antibodies were found in six patients (5,6%). Five of 6 infected patients were Female ( $p = 0.028$ ). All HIV positive patients have already been transfused and HIV seropositivity increased with the number of blood transfusions ( $r = 0.24$ ,  $P < 0.05$ ).

### Conclusion:

These results show the vulnerability of the polytransfused patients with sickle cell anemia towards HIV infection and the necessity of strengthening the transfusional safety policy.

### Keywords:

Sickle cell anemia, HIV, Blood transfusion

## INTRODUCTION

Sickle cell anemia (SCA) is an inherited genetic blood disorder (autosomal recessive disease) occurring in individual who are homozygous for a mutant hemoglobin gene. Cameroon is located in a highly endemic zone. The genetic marker is found in 25-30% of the population and 2-3% has SCA (1). HIV/AIDS is one of a major public health problem worldwide and in Cameroon, the prevalence of HIV infection was estimated to 5.5% in adult population in 2011 (1, 2). Sickle cell disease (SCD) is manifested primarily by a chronic hemolytic anemia and vaso-occlusive crisis. Patients with disease are

exposed to multiple blood transfusions throughout their life with a high risk of contacting viruses such as major human immunodeficiency virus (HIV). Human immunodeficiency virus (HIV) can be transmitted through blood transfusion with contaminated blood or its products, sexual means and mother-to-child. In Cameroon, the prevalence of HIV infection was estimated in 2011 around 4.3% in the whole population (3) and around 2.6% in the blood donations (4). In addition, the life expectancy of SCA patients increasing and many of them are engaged in sexual activities one of risk factors for transmission.

The aim of our study was to determine the prevalence of HIV antibodies in patients with SCA in the Yaoundé Central hospital where these patients are regularly followed and risk factors related to contamination of these patients with HIV.

### MATERIALS AND METHODS

From July 2008 to January 2009, we conducted a prospective, descriptive, analytical and cross investigation in the Department of Hematology and Medical Oncology (DHMO) of Yaoundé Central Hospital (YCH), Cameroon

Ethical approval was obtained from the National Ethical Committee before this study was undertaken.

All homozygous sickle cell patients attending regularly DHMO of YCH were included in the study. Questionnaires were completed after the obtained informed consent of patients. Biodata, history of blood transfusion with the number of transfusions, and pretransfusion HIV screening performed were collected and recorded on the data collection sheet.

For each individual, 5 ml of peripheral venous blood were collected in dry vacutainer tubes. After centrifugation at 3000 rpm for 15 minutes, the sera were collected and stored at -20° C. Serum samples were assayed for HIV antibodies and viral antigen by Enzyme Immunoassay (ELISA Fortress® Anti-HIV 1, 2, 0, UK) and immunochromatographic TDR (AbbottDetermine®HIV-1/2, Japan).

Categorical variables were summarized by frequencies. Numerical variables normally distributed were summarized by means and SDs. The number of received transfusions was estimated and its median was then calculated. Proportions for categorical variable were compared between different groups using Chi-square test or Fisher's exact test when appropriate. Numerical values were determined and compared using the U-test of Wilcoxon-Mann-Whitney. All statistical analysis was done using the Excel and the SPSS (version 10.1) software package for Windows.

Only factors that showed P-value <0.05 were considered as significant.

### RESULTS

Hundred and eight (108) sickle cell anemia patients were recruited; 57 (52.78%) were male with a male: female ratio of 1.1:1 (Tableau 1).

The mean age of all population was 21±9 years (range 5 to 47 years). We reported 93 patients (86.1%) who received at least one blood transfusion in their lifetime while 15 patients (13.9%) were never transfused. The maximum number of received transfusions was more than 10 (Tableau 2). Most (67, 6%) of SCA patients have received less than 5 transfusions.

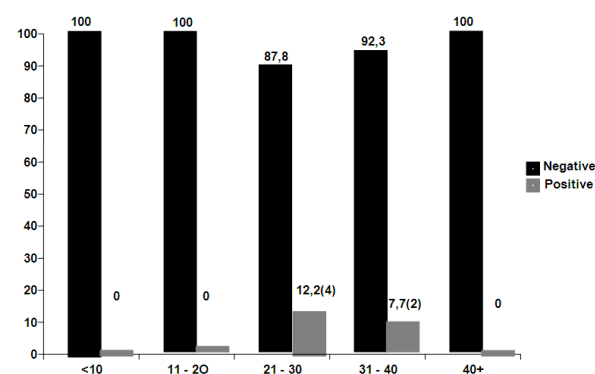
**Table 1.** Demographic profile, age distribution and HIV status

	Female	Male	Total
N (%)	51 (47,2)	57 (52,8)	108
<b>Age group, years</b>			
< 10	8	6	14
11-20	16	20	36
21-30	18	23	41
31-40	6	7	13
> 40	3	1	4
<b>HIV + test (%)</b>	5 (1,96) <sup>a</sup>	1 (1,75)	6 (5,55)

**Table 2:** Number of received transfusions of all patients

Nombre de transfusions	Fréquence	Pourcentage
0	15	13,9%
1-5	58	53,7%
6-10	21	19,4%
Plus de 10	14	13,0%
<b>Total</b>	108	100,0%

Out of 108 SCA patients included, only six patients (5.6%) presented a positive serology test to HIV (Tableau 1). The majority of them were female (5 vs 1) that represented 83.3 % of all transfused. The difference was significant ( $p = 0.028$ ). The age range of SCA patients with HIV were 21 years to 40 years old (Figure 1).



**Figure 1:** Prevalence of HIV antibodies according to age ( $p = 0,15$ ).

All SCA patients with HIV infection have already been transfused and HIV seropositivity increased with the number received transfusions ( $r = 0.243$ ,  $p < 0.05$ ,  $N = 108$ ) (Figure 2). Five patients (4.63%) reported using a common potentially contaminated materials such as razor blade, a needle tattoo or equipment room.

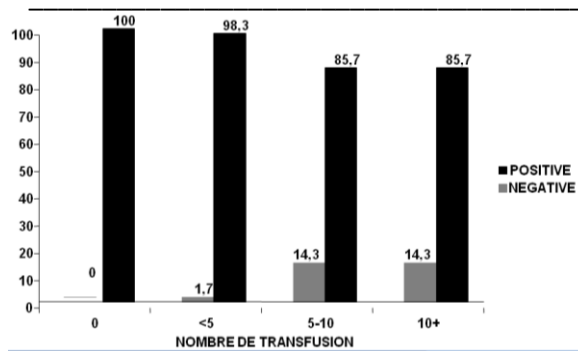


Figure 2: Prevalence of HIV antibodies according to the number of received transfusions.

## DISCUSSION

This study was conducted in 108 homozygous SCD patients with approximately the same number of male and female (ratio male: female =1,11:1). We found in this study, an HIV seroprevalence of 5.6% among the transfused SCA patients at the DHMO of YCH. This prevalence is similar to that (5.0%) reported by Segbena *et al.*, in University Hospital of Lomé on 119 sickle cell disease (SCD) (5). We reported that the majority of HIV patients are female (5 vs 1) and aged between 21 years to 40 years. This is according to the epidemiological data showing that women are most affected (6).

In the present study, the HIV prevalence increases with a number of receive transfusion. Roopam Jain and al., also reported in a study conducted on Indian multitransfused thalassemic patients that the number of units transfused can increase the risk of contamination (7). Transfusion-transmitted infection (TTI) from HIV blood donors' patients is dreaded. This can result in long-term morbidity and mortality with more serious consequences in vulnerable population like this. However, the TTI can also occur from blood donors negative for HIV as shown in this study conducted among multitransfused thalassemic children due to the residual risk(8). Therefore, residual risk of TTI transmission from screened blood depends on the safety of donor population, the sensitivity of tests used, the window-period donations but also mutant strains (8).

In a previous study, Noah and al., reported that infectious residual risk remains high (9.8%) among blood donors in YCH (9). Mbanya et al., showed in their study that prevalence at the blood donors had a prevalence of 7.9% for HIV (10- 11).

The fact that HIV prevalence is clearly increasing in the general population and consequently in blood donors makes that the risk of transfusion transmission of this disease remains high. It is therefore important to implement standards for strict selection of donors and introduce protocols and improved serological screening tests for the reduction of the residual risk of TTI.

In Cameroon, blood safety is a problem due to the lack of a National Blood Transfusion Centre and programs for recruiting low-risk donors. This situation causes a major blood-borne infections risk,

especially for sickle cell patients undergoing multiple transfusions to ensure their survival.

In the developing countries, blood donation is mainly non-voluntary, remunerated, family or family-replacement dependent (12). In this context, the Strategy for Africa Regional Committee for Blood Safety of World Health Organization (WHO) target by the year 2012 at least 80% of blood donations are benevolent, volunteers and non-remunerated (13). Guidelines on donations and blood transfusion coordinated at national or zonal levels and recommended by WHO (13) to ensure the availability and improved access to blood and blood products of high quality are still difficult to implement, especially in poor areas with limited resources. But, this is never the less essential. In a study conducted in Nigeria among SCD children, the prevalence of HIV is well below national estimates but highlights the continued risks of inadequate blood banking systems (14, 15).

## CONCLUSION

These results reinforce the need for a pre-transfusion screening for HIV with and programs to recruit low-risk donors. Standards and guidelines for the use of blood and blood products should be reviewed and streamlining blood products will minimize the number of transfusions. Also, alternatives to chronic blood transfusion in sickle cell patients, like the use of hydroxyurea (16), may need consideration in our setting.

Multitransfused SCD patients should be monitored serologically, the number of transfusions have to be reduced and Information, Education and Communication (IEC) sessions vis-à-vis sexually transmitted infections in general and vis-à-vis HIV / AIDS in particular, within hospitals and associations of SCD have to be organized.

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